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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/747,717	12/29/2003	Lance A. Baird	107293	5877

23490 7590 02/22/2006

JOHN G TOLOMEI, PATENT DEPARTMENT
UOP LLC
25 EAST ALGONQUIN ROAD
P O BOX 5017
DES PLAINES, IL 60017-5017

EXAMINER

WARTALOWICZ, PAUL A

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/747,717	BAIRD ET AL.	
	Examiner	Art Unit	
	Paul A. Wartalowicz	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/29/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6, 8-11, and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seachrist et al. (U.S. 6117809) in view of Castagnos, Jr. et al. (U.S. 4430201) and Ruettinger et al. (U.S. 2002/0147103).

Seachrist et al. teach a process for a catalytic reforming process (col. 8, lines 52-55) wherein the first three reformers in the process are maintained at a temperature of 454°C to 538°C and a pressure of from 50 to 200 psi comprising a first catalytic zone (reduction zone, col. 15, lines 57-62; col. 16, lines 3-8) and a second catalytic zone wherein the maintained temperature is in the range of 66°C-482°C (col. 13, lines 60-65) wherein a hydrogen to hydrocarbon mole ratio is from about 1-5 (C₁-C₆ hydrocarbons, col. 11, lines 58-62) wherein catalyst particles are spherical (col. 9, lines 30-32) wherein

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the catalyst particles pass downwardly from the bottom of reduction zone through multiple stages of reaction (catalyst flow from the top to the bottom of the stacked reactor arrangement, col. 16, lines 48-55). Seachrist et al. fail to teach wherein the process comprises determining a concentration of the carbon monoxide in the net hydrogen product stream and reducing the flow rate of the reforming catalyst passing through the reforming zone to thereby reduce the concentration of carbon monoxide in the net hydrogen product stream.

As to the limitation wherein reducing the flow rate of the reforming catalyst passing through the reforming zone to thereby reduce the concentration of carbon monoxide in the net hydrogen product stream, Castagnos, Jr. et al., however, teach a process for regenerating catalyst in hydrocarbon conversion reactions (col. 1, lines 4-8) wherein catalyst circulates between upper and lower zones of the reactor at rates of 25-35 lb/ft³ and wherein the rate of the flow rate of the catalyst is optimized for the purpose of completing carbon monoxide combustion (col. 5, lines 20-26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the flow rate of the catalyst, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980). The artisan would have been motivated to optimize the flow rate of the catalyst by the reasoned explanation that the flow rate of the catalyst may be optimized for the purpose of completing carbon monoxide combustion.

As to the limitation wherein determining a concentration of the carbon monoxide in the net hydrogen product stream, Ruettinger et al., however teach a process for generating carbon monoxide and hydrogen from hydrocarbons (paragraph 0002, lines 5-9) wherein CO conversion in the outlet stream is measured for the purpose of determining the activity of the catalyst (paragraph 0112, lines 1-6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide for the measurement of CO conversion in the outlet stream in Seachrist et al. in order to determine the activity of the catalyst (paragraph 0112, lines 1-6) as taught by Ruettinger et al.

As to the limitation wherein the net hydrogen product stream has a reduced concentration of carbon monoxide from about 0.1 to about 20 vppm carbon monoxide, the combined teachings of Seachrist et al., Castagnos, Jr. et al., and Ruettinger et al. teach a process as described above. The process of the combined teachings of Seachrist et al., Castagnos, Jr. et al., and Ruettinger et al. is similar to that of the applicant and inherently teaches the limitation wherein a neat hydrogen product stream contains from about 0.1 to about 20 vppm carbon monoxide.

Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seachrist et al. (U.S. 6117809).

Seachrist et al. teach a process for catalytic reforming as described in claims 1, 7, and 13. Seachrist et al. fail to teach wherein a liquid hourly space velocity from about 0.5 to about 4 hr⁻¹.

Seachrist et al., however, teach wherein the flow rates of the of reduction outlet gas streams are adjusted for the purpose of acquiring the desired temperature (col. 15, lines 45-52).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the flow rate of the reduction outlet, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980). The artisan would have been motivated to adjust the flow rate of the reduction outlet by the reasoned explanation that the flow rates of the reduction outlet gas streams can be adjusted for the purpose of acquiring the desired temperature as taught by Seachrist et al.

Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seachrist et al. (U.S. 6117809) in view of Anumakonda et al. (U.S. 6221280).

Seachrist et al. teach a process for catalytic reforming as described in claims 1, 7, and 13. Seachrist et al. fail to teach wherein a liquid hourly space velocity from about 0.5 to about 4 hr⁻¹.

Anumakonda et al., however, teach a process for the catalytic partial oxidation of hydrocarbons (col. 1, lines 6-10) wherein the liquid hourly space volume of greater than

about 0.5 h^{-1} is maintained for the hydrocarbon flow (col. 11, lines 13-16) for the purpose of controlling the contact time in which the hydrocarbon is contacted with the catalyst (col. 11, lines 15-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein the liquid hourly space volume of greater than about 0.5 h^{-1} is maintained for the hydrocarbon flow (col. 11, lines 13-16) in Seachrist et al. in order to control the contact time in which the hydrocarbon is contacted with the catalyst (col. 11, lines 15-20) as taught by Anumakonda et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Wartalowicz whose telephone number is (571) 272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paul Wartalowicz
February 17, 2006



COLLEEN P. COOKE
PRIMARY EXAMINER